

value of the predetermined attribute is close to the average value, and a large penalty is assigned to a phoneme data whose value of the predetermined attribute is far from the average value.

32. (New) A storage medium storing a control program for causing a computer to execute speech synthesis using phoneme data, said control program having:

code of a storage step of storing plural items of phoneme data;

code of a retrieval step of retrieving phoneme data, in accordance with given search retrieval conditions, from the plural items of phoneme data stored at said storage step;

code of a penalty assigning step of assigning a penalty to each of the plural items of phoneme data so as to raise the possibility that phoneme data whose value of a predetermined attribute is close to an average value of the predetermined attribute, is selected; and

code of a selection step of selecting, from the phoneme data retrieved at said retrieval step, and based upon the penalty assigned at said penalty assigning step, phoneme data employed in synthesis of a speech waveform.

REMARKS

Reconsideration of this application is respectfully requested in view of the foregoing amendments and the following remarks.

Claim Status

Claims 1-6, 8-17 and 19-27 are pending in this application. Claims 1-6, 8-17 and 19-24 have been allowed as stated in the Office Action, dated June 6, 2002. Claims 25-27 have been rejected. Claims 25-27 are herein amended. Claims 28-32 are herein added.

New claim 28 recites:

28. (New) A speech synthesizing apparatus comprising:

storage means for storing plural items of phoneme data;
retrieval means for retrieving phoneme data, in accordance with given retrieval conditions, from the plural items of phoneme data stored in said storage means;
penalty assigning means for assigning a penalty to each of the plural items of phoneme data so as to raise the possibility that phoneme data whose value of a predetermined attribute is close to an average value of the predetermined attribute, is selected; and
selection means for selecting, from the phoneme data retrieved by said retrieval means, and based upon the penalty assigned by said penalty assigning means, phoneme data to be employed in synthesis of a speech waveform.

Support for this claim can be found in the specification, *e.g.*, at p. 8, line 7 – p. 12, line 21, and in Figs 2 and 3. Claim 29 depends from claim 28 and further recites “wherein said penalty assigning means assigns a penalty in such a manner that a small penalty is assigned to a phoneme data whose value of the predetermined attribute is close to the average value, and a large penalty is assigned to a phoneme data whose value of the predetermined attribute is far from the average value.” Support for this claim can be found in the specification, *e.g.*, at p. 10, lines 3-14. Claims 30 and 31 are corresponding method claims. Claim 32 is a corresponding claim directed to a “storage medium storing a control program for causing a computer to execute speech synthesis using phoneme data.” Support for this claim can be found in the specification, *e.g.*, at p. 20, lines 15-23. Thus, these new claims are directed to matter in the specification, and do not represent new matter.

Rejections Under 35 U.S.C. §103

Claims 25-27 have been rejected under 35 U.S.C. §103 as being unpatentable over U.K. Patent Application No. GB 2313530A (“Campbell”) in view of U.S. Patent No. 5,751,907 (“Moebius”).

Claim 25 has been herein amended to recite “storage means for storing plural items of phoneme data, wherein each item of phoneme data includes an attribute value for phoneme environment, phoneme boundary and fundamental frequency, power and phoneme duration...” Support for this amendment can be found in the specification, *e.g.*, at page 8, lines 14-17 and Fig. 2. Claim 25 has been further amended to recite “retrieval means for retrieving phoneme data having identical phoneme environments and fundamental frequencies from the plural items of phoneme data stored in said storage means...” Support for this amendment can be found in the specification, *e.g.*, at page 9, lines 16-20 and Fig. 3. Claims 26 and 27 have been similarly herein amended. No new matter is introduced by these amendments.

Claim 25, as herein amended, requires that the phoneme data include attribute values for each of five specific traits, *i.e.*, phoneme environment, phoneme boundary and fundamental frequency, power and phoneme duration. Furthermore, the amended claim requires that the phoneme data that are retrieved have identical phoneme environments and fundamental frequencies. The phoneme environment is a triphone, described at p. 8, lines 2-5 of the specification, or a triphone substitute, described at p. 13, lines 2-13 of the specification.

Applicants submit that these features are neither taught nor suggested by the cited references. Campbell discloses a list of “feature parameters” associated with each phoneme, but this list does not include a parameter that corresponds to phoneme environment. Moebius discusses phoneme sequences, but does not disclose a selection step based on identical phoneme environments and fundamental frequencies. Consequently, Applicants respectfully submit that new claims 25-27 are allowable over the art of record taken alone or in combination.

Accordingly, Applicants respectfully submit that this application is in condition for allowance, which action is respectfully requested.

AUTHORIZATION

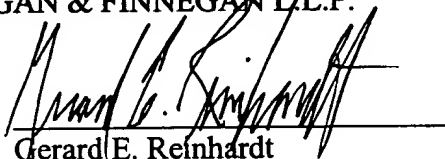
No extension of time is believed necessary for this filing. However should an extension be required to render this Amendment timely filed, the Commissioner is hereby petitioned for such extension and authorized to charge any additional fees, or credit any overpayment to Deposit Account No. 13-4500, Order No. 1232-4563. A DUPLICATE OF THIS SHEET IS HEREWITH INCLUDED.

In the event that a telephone conference would facilitate prosecution of the instant application in any way, the Examiner is invited to contact the undersigned at the number provided.

An early and favorable examination on the merits is respectfully requested.

Respectfully submitted,
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APPENDIX:
CLAIM AMENDMENTS SHOWING INTERLINEATIONS AND DELETIONS

Please amend claims 25-27 to recite the following:

25. (Amended) A speech synthesizing apparatus comprising:

storage means for storing plural items of phoneme data,

wherein each item of phoneme data includes an attribute value for phoneme environment, phoneme boundary and fundamental frequency, power and phoneme duration;

retrieval means for retrieving phoneme data [, in accordance with given retrieval conditions,] having identical phoneme environments and fundamental frequencies from the plural items of phoneme data stored in said storage means;

first penalty assigning means for sorting the phoneme data retrieved by said retrieving means based upon a prescribed attribute value and for assigning a penalty that is based upon an attribute value to each item of the phoneme data on the basis of order obtained by sorting; and

selection means for selecting, from the phoneme data retrieved by said retrieval means, and based upon the penalty assigned by said first penalty assigning means, phoneme data to be employed in synthesis of a speech waveform.

26. (Amended) A speech synthesizing method comprising:

a storage step of storing plural items of phoneme data,

wherein each item of phoneme data includes an attribute value for phoneme environment, phoneme boundary and fundamental frequency, power and phoneme duration;

a retrieval step of retrieving phoneme data [, in accordance with given search retrieval conditions,] having identical phoneme environments and fundamental frequencies from the plural items of phoneme data stored at said storage step;

a first penalty assigning step of sorting the phoneme data retrieved at said retrieving step based upon a prescribed attribute value and of assigning a penalty that is based upon an attribute value to each item of the phoneme data on the basis of order obtained by sorting; and

a selection step of selecting, from the phoneme data retrieved at said retrieval step, and based upon the penalty assigned at said first penalty assigning step, phoneme data employed in synthesis of a speech waveform.

27. (Amended.) A storage medium storing a control program for causing a computer to execute speech synthesis using phoneme data, said control program having:

code of a storage step of storing plural items of phoneme data,

wherein each item of phoneme data includes an attribute value for phoneme environment, phoneme boundary and fundamental frequency, power and phoneme duration;

code of a retrieval step of retrieving phoneme data [, in accordance with given search retrieval conditions,] having identical phoneme environments and fundamental frequencies from the plural items of phoneme data stored at said storage step;

code of a first penalty assigning step of sorting the phoneme data retrieved at said retrieving step based upon a prescribed attribute value and of assigning a penalty that is based upon an attribute value to each item of the phoneme data on the basis of order obtained by sorting; and

code of a selection step of selecting, from the phoneme data retrieved at said retrieval step, and based upon the penalty assigned at said first penalty assigning step, phoneme data employed in synthesis of a speech waveform.